

The Government Role in Developing the Clean and Efficient Future Car



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A Trio of Issues for the Future Car



Climate
Change



Urban Air
Quality



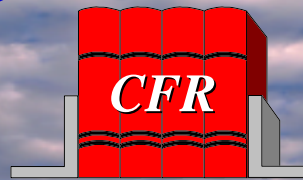
Oil Use/Imports
(Energy Conservation)

Four Answers to “What Can the Government Do?”

**Technology
RD&D**



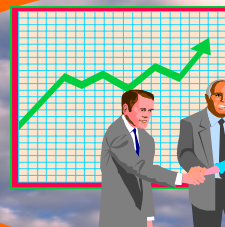
**Legislation &
Regulation**



**Market
Incentives**

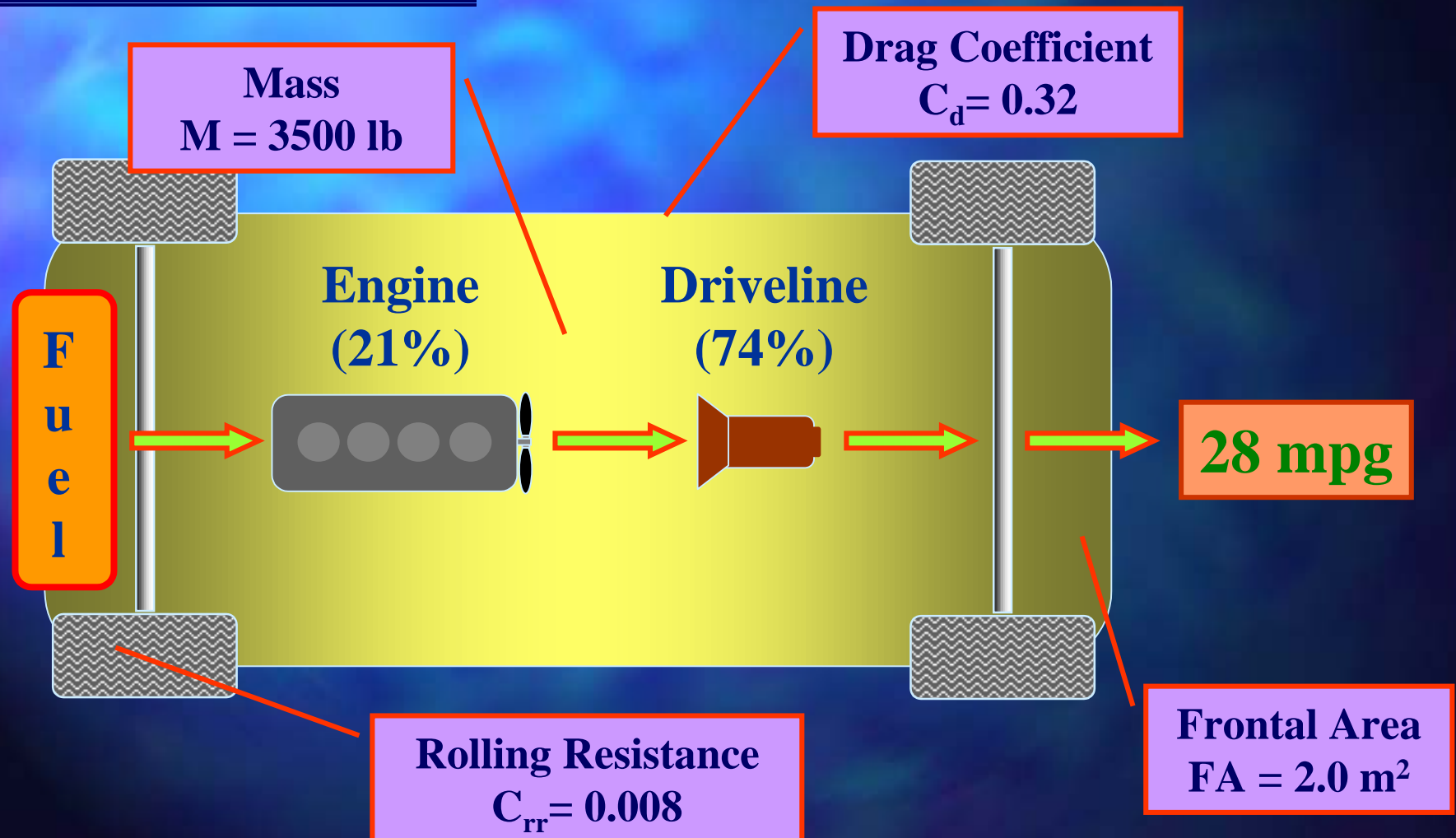


**Market
Development**



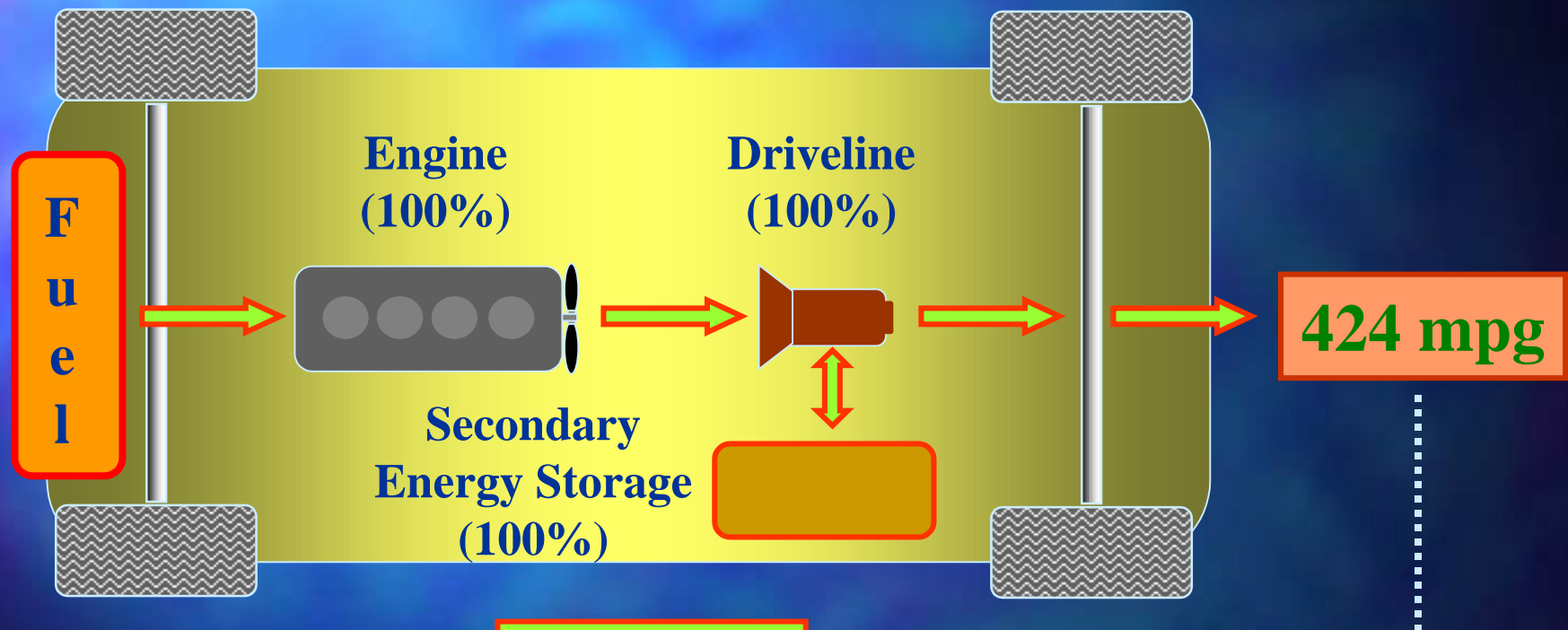


Example: Enormous Potential for MPG Improvements



Theoretical Hybrids Provide MPG Benchmarks

Technology
RD&D

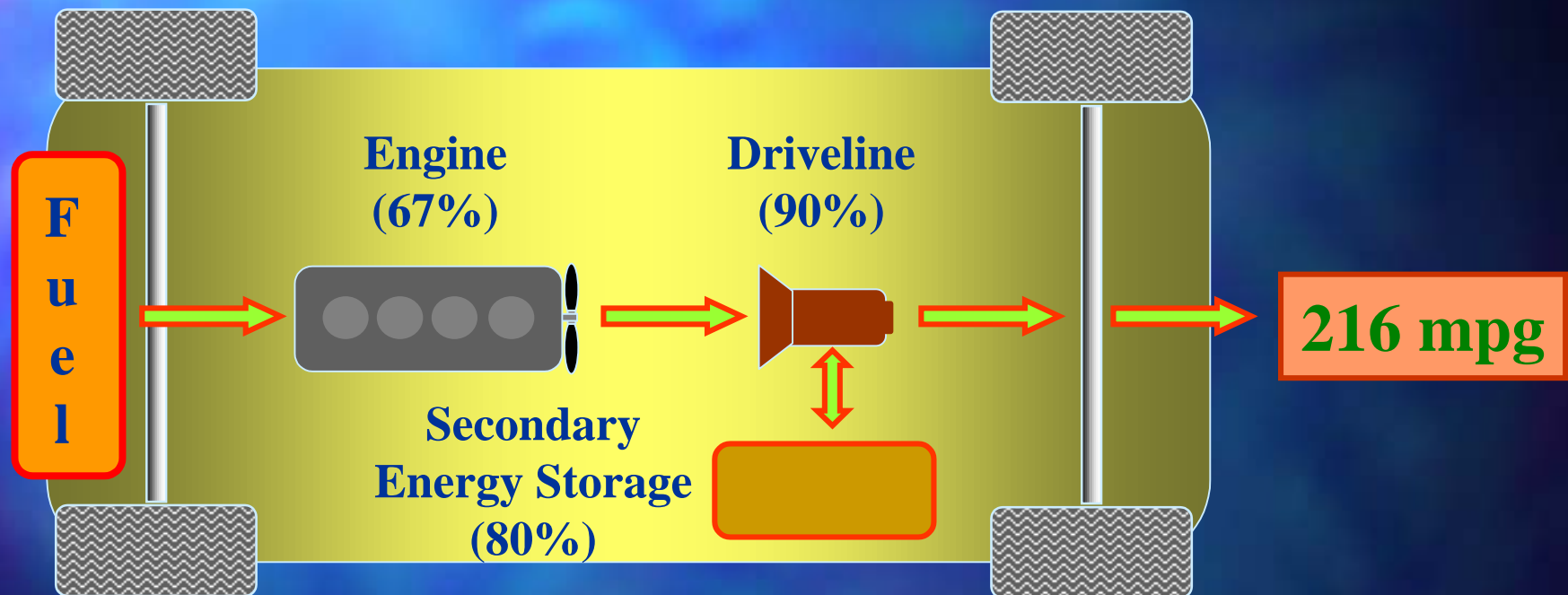


$C_d = 0.2$
 $FA = 2.0 \text{ m}^2$
 $C_{rr} = 0.006$
 $M = 3500 \text{ lb}$

With high efficiency (33%)
engine: *140 mpg*
Without regenerative
braking: *70 mpg*

What is a Reasonable Long Term Target for Hybrid MPG?

Technology
RD&D



$$\begin{aligned} C_d &= 0.2 \\ FA &= 2.0 \text{ m}^2 \\ C_{rr} &= 0.006 \\ M &= 3500 \text{ lb} \end{aligned}$$

Technology RD&D for the Clean & Efficient Future Car

Technology
RD&D



- **Mechanism:** Government provides appropriate budget for technology innovation & demonstration
- **Rationale:** Apply when market forces or regulatory requirements are lacking
- **Prototype example:** Partnership for a New Generation of Vehicles



Legislation/Regulation for the Clean & Efficient Future Car

Legislation
& Regulation



- **Mechanism:** Legislated emission and fuel economy standards
- **Rationale:** Achieve environmental objectives when market forces are absent; create level playing field
- **Prototype Examples:** Tier II Standards; Corporate Average Fuel Economy (CAFE)



Market Incentives for the Clean & Efficient Future Car

- **Mechanism:** vehicle tax credit
 - *Most Direct:* performance standard
 - *Alternative:* design standard that doesn't pick winners/losers
- **Rationale:** *launch assist* overcomes capital investment barrier & initial low volumes
- **Prototype Example:** President's Advanced Vehicle Tax Credit



Market Development for the Clean & Efficient Future Car

- **Mechanism:** voluntary commitments to purchase clean & efficient vehicles
- **Rationale:** lead by example; demonstrate technologies in the marketplace
- **Prototype Example:** Voluntary Fleet Purchase Program